COMPACT MIXER

MM 502

USER'S MANUAL

PHONIC

www.phonic.com

!!! SAFETY PRECAUTIONS !!!

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK,

DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

Avoid exposing rain, water, or any form of liquid to this unit.
IMMEDIATELY unplug its power cord from its power source and contact a qualified technician when the unit is exposed to rain, water, or any form of liquid.
Keep the unit away from heat sources like radiators, heat registers, stoves and etc.
ALWAYS have a qualified technician present when repairing or modifying this unit.

The arrowhead lightning flash symbol within an equilateral triangle is intended to alert you to the presence of uninsulated "dangerous voltage" inside the enclosure that may be sufficient to constitute a risk of shock.

The exclamation point within an equilateral triangle is intended to remind you to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

!!! CAUTION !!!

TO REDUCE THE RISK OF ELECTRIC SHOCK,

DO NOT REMOVE THE COVER OR THE BACK OF THE UNIT.

No user-serviceable parts inside. Always contact a qualified technician for repair or modification.
DO NOT open, modify, or disassemble the unit without a qualified technician present. Any change or repair of the unit requires the presence of a qualified technician for the warranty to remain effective.
Clean the unit with damp cloth and dry brush. No other solvents are recommended for cleaning. Routine cleaning and proper maintenance guarantee best performance from the unit.
Carefully packed at the manufacturing site, the packing box is designed to protect the unit from rough handling. Please examine carefully the content inside the package and make sure the unit is well, undamaged.
Notify your dealer and the shipping company immediately when you find the unit damaged from shipping. Claims for damage or replacement would only be granted when reported properly and in a timely manner.
Use damp cloth or dry brush to clean the unit. **DO NOT** use any other solvents for cleaning. Good care and maintenance of your unit will prolong your unit' s operational life and insure its optimal performance.

Phonic reserves the right to improve or alter any information suppied within this document without prior notice. V1.1 2003/04/11

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INTRODUCTION

Thank you for purchasing MM502 mixer. Based on years of experience in designing and manufacturing professional audio equipment, PHONIC designed this versatile mixer for those who need a mixer to handle small size venue, recording studio and/or PA installation. It comes with 2 microphone inputs, 5 line inputs. It' s so compact, you would not believe that this is a mixer suitable for so many applications!

This unit is designed with great care and great attention to details, so please read this manual carefully. Look after it and keep it in a safe place for future reference.

FEATURES

- Extremely low noise preamps using NJM2068 IC
- 2 Mic inputs in total
- 5 Line inputs
- 1 mic/line and 2 stereo channels
- Low cut, 2-Band EQ and insert on mono input channel
- 2T RTN and 2T REC for CD or tape player
- Global +48V Phantom Power
- Dual 4-segment master level meter
- Headphones Output with volume control
- Peak LEDs on mono input channel

GETTING STARTED

1. Check the AC voltage before connecting the power plug to the outlet. Make sure the AC power supply shares the same voltage used in your country (For example, while some countries use 100V, others use 120V, 230V, or 240V). Proper grounding prevents user from experiencing electrical shock.
2. Setup the mixing console where the operator can clearly hear the reproduced sound.
3. Try to use balanced connection whenever possible. Make sure power cord is not mixed with wiring for lighting. If necessary, cross audio and lighting cables at 90 degree angle to minimize the possibility of interference. Keep unbalanced cabling as short as possible.
4. Before turning on the power, make sure all faders are turned down to prevent other equipments from harming.
5. Check your cables regularly and label each end clearly for immediate identification.
6. Always turn off the power before connecting to and disconnecting from the unit.
7. Always turn on the unit before turning on power amplifiers and turn it off only after power amplifiers have already been turned off.

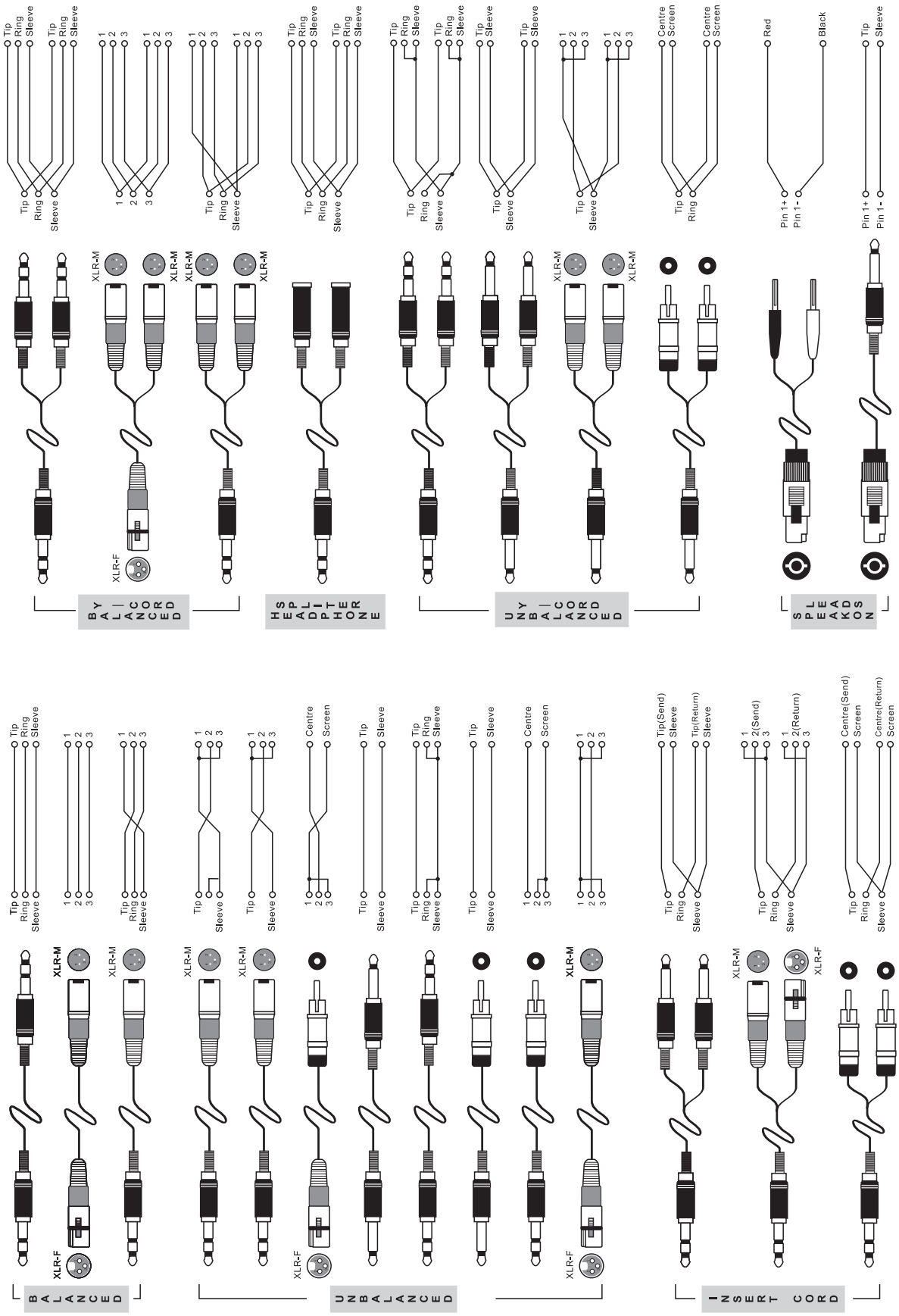
TYPICAL CONNECTING LEADS

On next page please find the typical connecting leads illustration that are divided into seven categories: BALANCED, UNBALANCED, INSERT CORD, BALANCED Y-CORD, HEADPHONE SPLITTER, UNBALANCED Y-CORD, AND SPEAKON LEADS . In each category, you will be able to find the different wiring for different connectors for possible application.

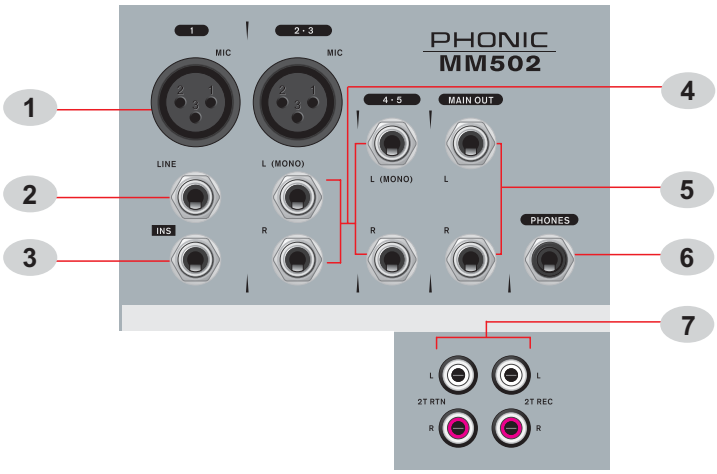
For MM502 compact mixer, the following are balanced: MAIN OUT, MIC/LINE IN(channel1~2), and Stereo Channel(CH2/3~4/5). And the following are unbalanced: 2T RTN, 2T REC, PHONES.

When connecting active-balanced direct out to an external device with unbalanced input, use a 3-port 1/4" TRS plug for the source (output) end and a 2-port 1/4" TS plug for the load (input) end while disconnect the conductor to the Ring of the source. This provides the best condition for active-balanced output.

TYPICAL CONNECTING LEADS ILLUSTRATION



CONNECTING PANEL DESCRIPTION



INPUT CHANNEL

1 MICROPHONE INPUT

Mic input on CH1 and CH2/3 accepts XLR-type connectors. We recommend using professional balanced dynamic, condenser or ribbon mics for microphone input because they are the least likely to be interfered.

When using condenser microphone, make sure the +48V Phantom Power is turned on. See PHANTOM POWER for more information.

2 LINE INPUT

Line input on CH1 accepts 1/4" TRS jacks. Except for microphone signal, it welcomes signals from sources like keyboard, electronic drum, tape recorder and etc. When you use unbalanced 1/4" TRS jack, the line input automatically turns the Ring into ground. The ring must be grounded if the source is unbalanced.

3 INSERT

Unbalanced insert point accepts 1/4" TRS plug, suitable for devices such as signal processors like limiters, compressors (PHONIC PCL3200), and graphic equalizers (PHONIC MQ3229/3300/3400). When an insert is not in use, signal goes directly to its destination. For an illustration of insert cords, see the section entitled TYPICAL CONNECTING LEADS.

4 STEREO LINE INPUT

There are two sets of stereo input channels accepting balanced 1/4" TRS plugs. When the input signal is mono, plug into the "L(MONO)" channel, and the signal will be mirrored to the "R" channel. Stereo signals from electronic keyboard, synthesizer, sampler or any Hi-fi stereo equipment like CD, DVD, MD, DAT and etc., can be connected to these input channels. For CH 2/3, do not plug into both MIC and stereo line-in (L/R) at the same time.

MASTER SECTION

5 MAIN OUT

Using 1/4" TRS connector, you can send balanced line level signals in stereo from the mixer to external devices like recorders, graphic equalizers, amplifiers, and etc.

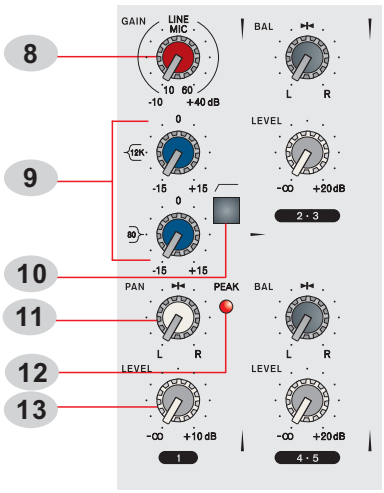
6 PHONES

One 1/4" unbalanced TRS jack for connecting headphones to monitor the main out content or the 2T RTN content.

7 2T RTN & 2T REC

2T RTN and 2T REC accept semi-professional signal via RCA connectors. While 2T RTN can be connected to CD, DAT, MD, tape players for playback, 2T REC can be used with CD, DAT, MD, and tape recorders for recording purposes. If you want to use 2T RTN to monitor the contents recorded in recorder, you can connect both 2T RTN and 2T REC to the same recorder. Push the "TO PHONES" button on the 2T RTN control section to listen to the recorded contents and track the problems. However, please remember to release the "TO L/R" button at the 2T RTN control section to avoid feedback.

CONTROL DESCRIPTION



INPUT CHANNEL

8 GAIN

This rotary knob adjusts the mono channel signal level. If it is set too high, the signal will distort and lose definition. When it is set too low, you will not be able to get enough signal level for output. Proper gain setting allows mixer to work at the best operating level.

The inner-ring for microphone input indicates level from +10dB to +60dB while the outer-ring for line input indicates level from -10dB to +40dB.

9 EQUALIZER

Equalizers are designed to suit different room acoustics, feedback control and thus improve the live sound. Always begin with the "0" position and avoid excessively cutting/boosting peculiar frequency, which will limit the systems dynamic range or sometimes even increase the possibility of the unpleasant feedback sound.

The level control for each band provides 15dB of boost or cut at its frequency. Position the knob at the "0" position when you do not intend to make any adjustment.

HIGH (12KHz)

Turn the knob clockwise to add crispness to cymbals, vocals and electronic instruments. Turn it counter-clockwise to reduce sibilance or hiss.

LOW (80Hz)

Boost at this frequency could add extra punch to guitars, drums and keyboards by turning clockwise. Cut it to reduce stage rumble, hum or to improve a mushy sound.

10 LOW CUT

Push down the LOW CUT button adds the 18dB per octave 75Hz low cut filter in the signal path, which can be used on live vocals to reduce stage rumble or "popping" from microphones. It can also cut off low frequency hum.

11 PAN (CH-1) / BAL (CH2/3 & 4/5)

PAN, short for panoramic potentiometer, is a control that divides a signal between two channels in an adjustable ratio. By doing so, PAN controls the location of a sonic image between the left and the right channel of the MAIN out. When it is turned fully to the left (L), the signal will be routed to the left channel only. Turn it fully to the right (R) you would route signal to the right channel only. Set it in the center, both left and right channels will have the same level from the input channel.

BAL control on input channel 2/3 & 4/5 allows you to balance the left and right input source between the stereo sound images.

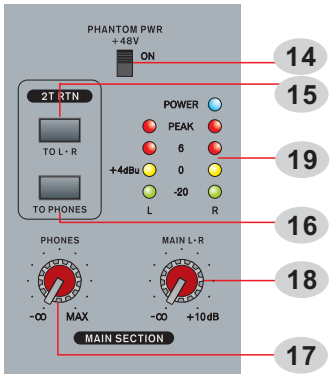
12 PEAK INDICATOR

Right before the input channel signal becomes distorted and loses definition, the PEAK LED will come on. The level of the GAIN control should therefore be reduced when it remains on or blinks constantly.

13 CHANNEL LEVEL CONTROL

This rotary level control determines the final output level of the related input channel.

MASTER SECTION



14 +48V PHANTOM POWER

Condenser microphones need phantom power. Therefore, you should turn it on when using condenser microphones. Located at the control panel, a master switch provides total control over two mic input. Turn all level controls to the minimum level before switching on phantom power, and always plug in microphones before turning on phantom power. Doing so would prevent harming the equipment as well as avoid producing unwelcome noise.

WARNING: Do not use unbalanced microphone with Phantom Power on; it might damage your microphone.

15 TO L/R

2T RTN signal will be sent to main out if you push this button.

16 TO PHONES

When this button is depressed, the signal from 2T RTN is sent to the PHONES output, and the signal level is displayed on the LED LEVEL METERS.

17 PHONES

Adjust this knob to control the signal level going to the headphones (PHONES) output.

18 MAIN L/R LEVEL CONTROL

A rotary level control determines the final output level of the final level of MM502. Its setting will also affect the final output level of 2T REC.

19 POWER, PEAK, & LEVEL METER

POWER

This blue LED comes on when the power of the mixer is being turned on.

PEAK

PEAK LEDs will light up to indicate possible signal overload.

LEVEL METER

These level meters offer visual display of the MAIN output level when the "TO PHONES" button at 2T RTN section is released. With 3-segment LEDs consisted of green, yellow and red LEDs, they begin from -20dBu to +6dBu. This meter is calibrated to 0 = +4 dBu, as indicated on the panel.

20 POWER SOCKET

This 3-PIN socket connects to an AC Adaptor that sends power into the mixer. Having an external power supply helps to avoid possible power interference and guarantees good sound quality. Before connecting to the external power supply, please make sure the voltage of the AC power supply is exactly the one used in your country. The chart below lists the part number and the voltage of the power supply.

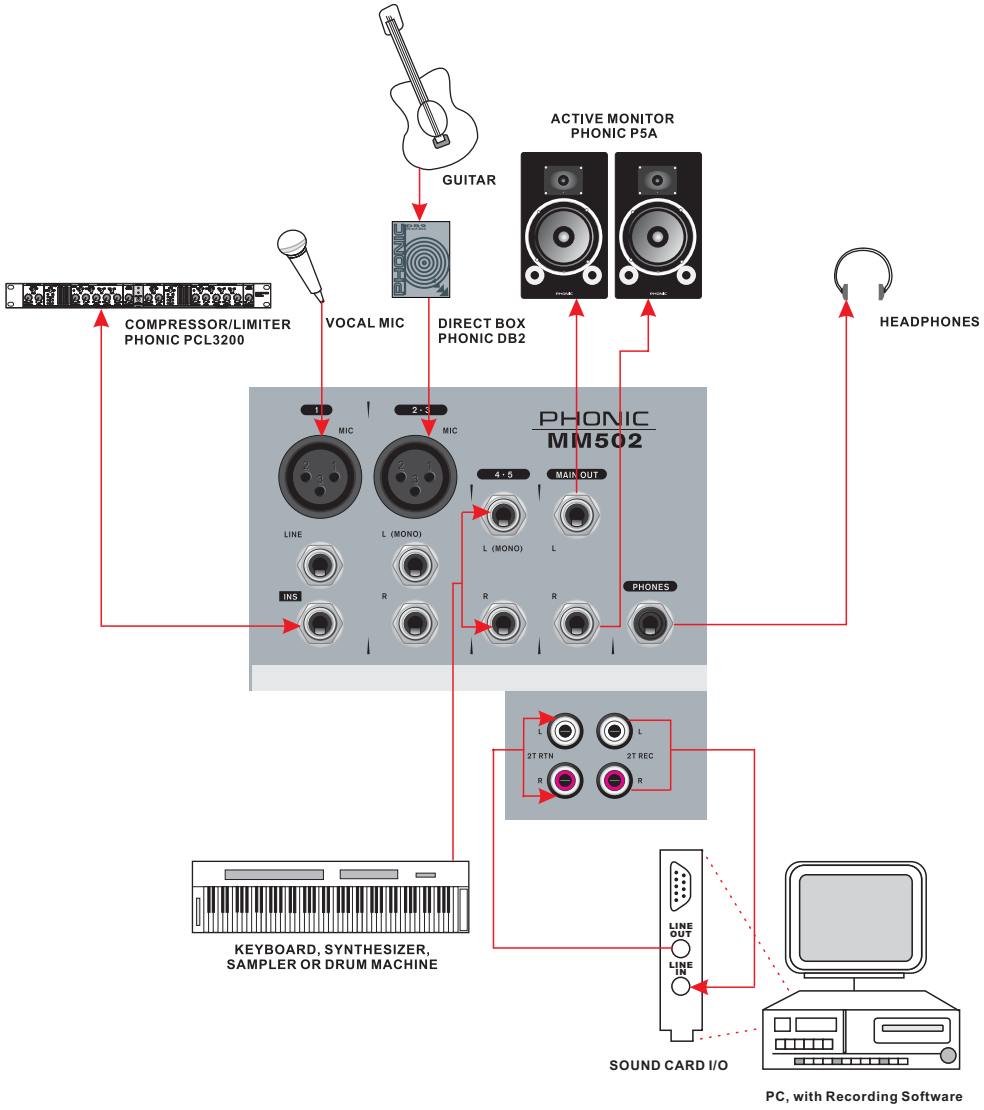
VOLTAGE	PART NO
100VAC	353-60101-100-0
120VAC	353-60101-000-0
127VAC	353-60101-001-0
220VAC	353-60102-000-0
230VAC	353-60104-000-0
240VAC	353-60106-000-0 353-60107-000-0 353-60109-000-0

21 POWER SWITCH

Turn the unit on with this switch. Turn down the MAIN out level control to the minimum level before switching on the power. The blue LED at the front panel will come on when power is being turned on.

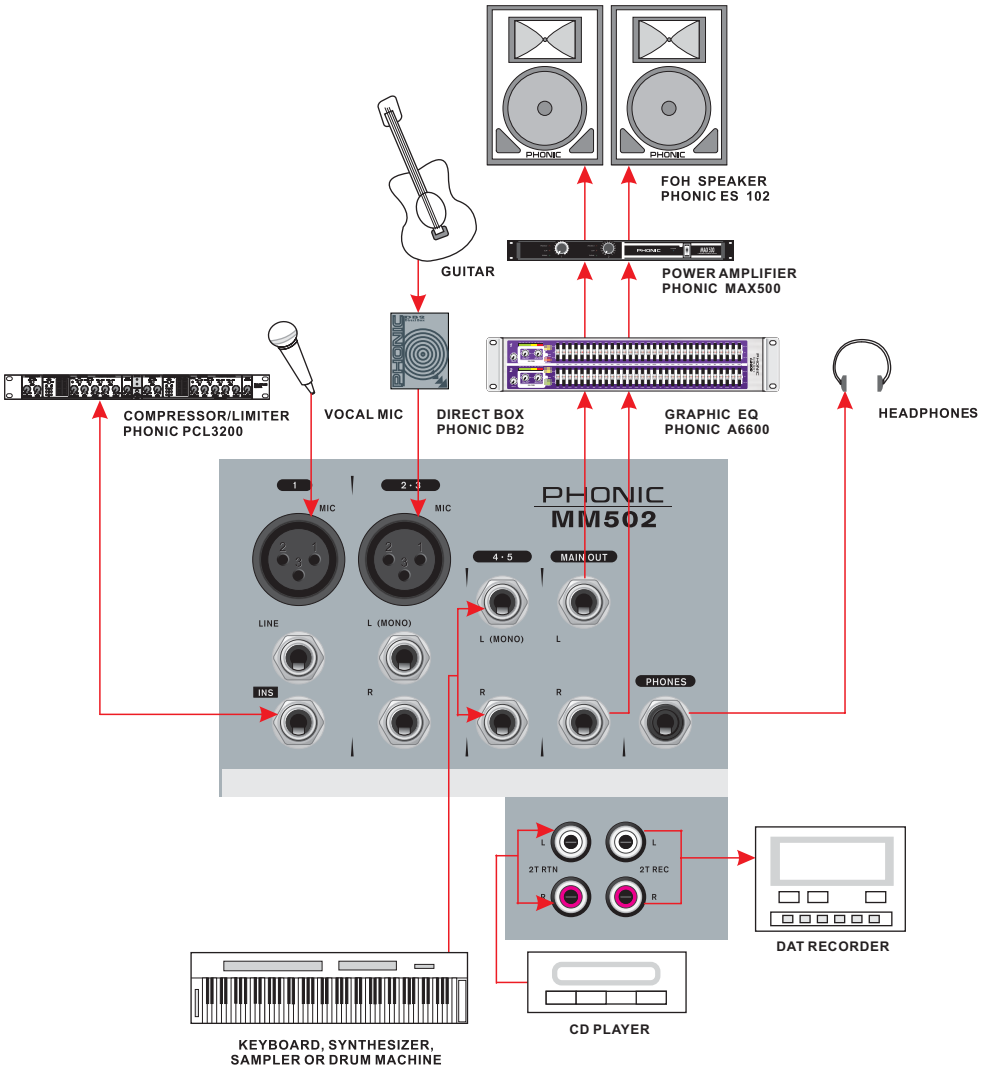
APPLICATION ILLUSTRATION

COMPUTER RECORDING SETUP

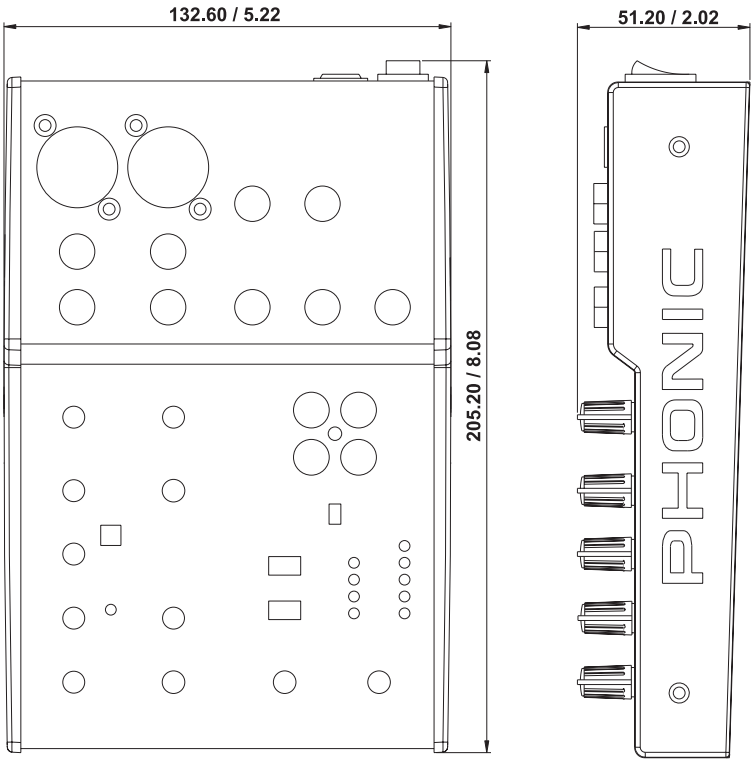


ATTENTION: Release the "TO L/R" button at the 2T RTN section to avoid feedback.

SMALL PA SYSTEM

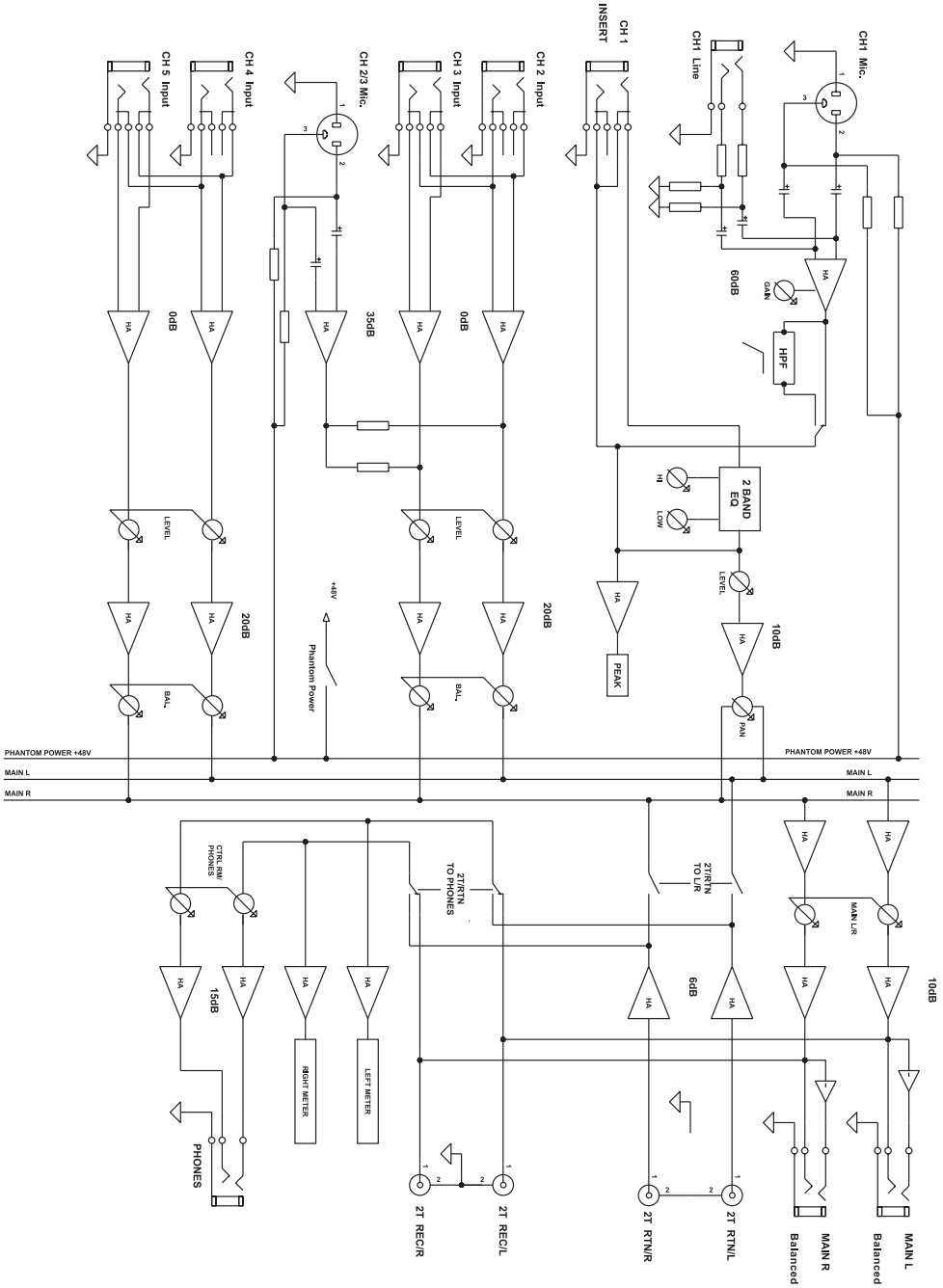


DIMENSIONS



DIMENSIONS ARE SHOWN IN MM/INCH.

BLOCK DIAGRAM



SPECIFICATIONS

	MM502
Inputs	
Balanced mono mic/line channels	1
Balanced stereo line channels	2(1 incl. mic preamp)
2T RTN	1
Outputs	
Main L/R stereo	1/4" TRS, Bal.
2T REC	1
Phones	1
Channel Strips	**3**
Pan/balance control	Yes
LED indicators	Peak (mono channel only)
Volume controls	Rotary
Inserts	1
Master Section	
Phones/Level control	Yes
Faders	Main (Rotary)
Metering	**ST**
Number of channels	2
Segments	4
Phantom Power Supply	**+48VDC**
Switches	Master
Noise(20Hz to 20KHz bandwidth, line inputs to main L/R outputs, all channels assigned, panned	
Master @ unity, channel fader down.	-89dBu
Master @ unity, channel fader @ unity.	-86dBu
S/N ration, ref to +4	>90dB
THD: Any output, 1KHz @ +14dBu, 20Hz to 20KHz, channel inputs.	**<0.005%**
CMRR: 1 KHz @ -60dBu, Gain at maximum	**80dB**
Crosstalk (1KHz @ 0dBu, 20Hz to 20KHz bandwidth, channel in to main L/R outputs)	
Channel fader down, other channels at unity	<-86dB
Channel muted, other channels at unity	<-85dB
Frequency Response	
10Hz ~ 30KHz (Mic input to any output)	+0/-1 dB
Maximum Level	
Mic preamp input	+10dBu
All other inputs	+22dBu
Balanced output	+28dBu
Unbalanced output	+22dBu
Impedance	
Mic preamp input	2 K ohmS
All other inputs (except insert)	10 K ohmS
RCA 2T outputs	1K ohmS
All other outputs	150 ohmS
Equalization	**2-band, +/-15dB**
Low EQ	80Hz
Hi EQ	12KHz
Low cut filter	75Hz(-12dB/oct)
Microphone Preamp E.I.N. (150 ohm terminated, max gain)	**<-129.5dBm**
Power Consumption	**10 watts**
Power Requirement (depends on region)	**100~120V AC, 220~240V AC, 50/60Hz**
Weight	**0.8kg (1.8lbs)**
Dimensions(WxHxD)	**205.2x51.2x132.6mm (8.08"x2.02"x5.22")**

Due to continually improving product performance, specifications are subject to change without notice.

SUGGESTED READINGS

Phonic recommends the following books for those who are interested in advanced audio engineering and sound system operation:

- Sound System Engineering by Don and Carolyn Davis, Focal Press, ISBN: 0-240-80305-1
- Sound Reinforcement Handbook by Gary D. Davis, Hal Leonard Publishing Corporation, ISBN: 0-88188-900-8
- Audio System Design and Installation by Philip Giddings, Focal Press, ISBN: 0-240-80286-1
- Practical Recording Techniques by Bruce and Jenny Bartlett, Focal Press, ISBN: 0-240-80306-X
- Modern Recording Techniques by Huber & Runstein, Focal Press, ISBN: 0-240-80308-6
- Sound Advice – The Musician Guide to the Recording Studio by Wayne Wadham, Schirmer Books, ISBN: 0-02-872694-4
- Professional Microphone Techniques by David Mills Huber, Philip Williams. Hal Leonard Publishing Corporation, ISBN: 0-87288-685-9
- Anatomy of a Home Studio: How Everything Really Works, from Microphones to Midi by Scott Wilkinson, Steve Oppenheimer, Mark Isham. Mix Books, ISBN: 091837121X
- Live Sound Reinforcement: A Comprehensive Guide to P.A. and Music Reinforcement Systems and Technology by Scott Hunter Stark. Mix Books, ISBN: 0918371074
- Audiopro Home Recording Course Vol 1: A Comprehensive Multimedia Audio Recording Text by Bill Gibson. Mix Books, ISBN: 0918371104
- Audiopro Home Recording Course Vol. 2: A Comprehensive Multimedia Audio Recording Text by Bill Gibson. Mix Books, ISBN: 0918371201

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